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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/466,174	12/17/1999	HIDENORI KAWANISHI	0717-0429P	9854

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EXAMINER

MENEFEE, JAMES A

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 07/16/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/466,174

Applicant(s)

KAWANISHI ET AL.

Examiner

James A. Menefee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-8 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.



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Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 June 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 21 June 2002 has been entered.

Response to Amendment

In response to the Amendment filed 21 June 2002, claims 3 and 12-15 are cancelled and claims 1 and 7-8 amended. Claims 1-2 and 4-8 are pending.

Drawings

The corrected drawings were received on 21 June 2002. These drawings are acceptable.

Claim Objections

Claim 7 is objected to because of the following informalities: the word "tat" in line 3 should read -at-. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-2 and 4-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Each of these claims discusses a semiconductor layer. However, claim 1 as amended now contains two parts that are referred to as semiconductor layers. The semiconductor layers of claim 1 should be referred to as "first" and "second" semiconductor layers, and all references to semiconductor layers in the subsequent claims should likewise refer to "first" or "second" semiconductor layers. It is believed that claims 2 and 5-8 are referring to the semiconductor layer that is the spot-size converter, and claim 4 is referring to the semiconductor layer that is provided on a boundary plane.

Double Patenting

Applicant is advised that should claim 5 be found allowable, claim 7 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground

provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-2 and 4-8 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 4, 7, and 9 of U.S. Patent No. 6,163,631 (Kawanishi). Although the conflicting claims are not identical, they are not patentably distinct from each other as follows:

Regarding claim 1, claim 3 of Kawanishi claims a semiconductor laser and a semiconductor layer formed on the same substrate. The semiconductor layer has a refractive index that varies in a layer direction. Claim 7 of Kawanishi claims a second semiconductor layer provided on a boundary plane between the laser region and the semiconductor layer. It is not claimed that the refractive index of this second semiconductor layer be approximately constant. However, since there is no suggestion otherwise, the semiconductor layer should be made of approximately constant refractive index so as not to interfere with the spot-size converter portion.

Regarding claim 2, claim 4 of Kawanishi claims the refractive index should be highest at the center of the semiconductor layer, i.e. consistent with a central portion of light emitting from the laser.

Regarding claim 4, claim 9 of Kawanishi claims a dielectric layer between the laser region and the semiconductor layer.

Regarding claims 5-8, claim 3 of Kawanishi claims an optical waveguide at an opposite side of the semiconductor laser region facing the semiconductor layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paoli (US 5,228,049) in view of Andrews (US 5,175,643). Paoli discloses the following in Figs. 2, 6 and the discussion thereof.

Regarding claims 1 and 4, Paoli discloses a semiconductor laser device with a spot-size converter comprising a semiconductor substrate 20 having a semiconductor laser region 10 and a semiconductor layer 10' thereon, wherein the semiconductor layer 10' is a spot-size converter and the refractive index of the semiconductor layer 10' varies in a layer direction continuously or in a stepwise manner. There is not disclosed as in claim 1 another semiconductor layer having an approximately constant refractive index, or as in claim 4 a dielectric layer, either layer being provided on a boundary plane between the laser region and the semiconductor layer. Paoli does disclose a boundary layer 33 between these two regions without specifying what type of layer it is. The boundary layer is for separating the contacts of the two regions so that the regions may be individually biased (col. 4 lines 35-39). Andrews teaches an integrated laser amplifier structure similar to Paoli where there is a boundary 54 that may be a dielectric layer or a proton implanted semiconductor layer (col. 4 line 53 – col. 5 line 4). It would have been obvious to one skilled in

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the art to use a semiconductor layer or a dielectric layer as the boundary layer 33 of Paoli, as taught by Andrews, because it will perform the stated function of the boundary layer 33, as taught by Andrews.

Regarding claim 2, Paoli discloses that the semiconductor layer 10' is formed such that the region having the highest refractive index is substantially consistent with a central portion of light distribution emitting from the semiconductor laser region 10.

Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paoli and Andrews as applied to claims 1-2 and 4-8 above, and further in view of Sanders et al (US 5,912,910). Paoli and Andrews teach all of the limitations of claims 1-2 and 4-8 as shown above, but do not teach that that the device further comprises a light waveguide region at an opposite side of the laser region and facing the semiconductor layer. Sanders teaches as in figure 8 and the discussion thereof a MOPA where the output is coupled into a waveguide. It would have been obvious to one skilled in the art to include a waveguide region at the opposite side of the laser region and facing the semiconductor region in the device of Paoli, as taught by Sanders, as this waveguide can be an oscillator causing the propagation of light, as taught by Sanders.

Response to Arguments

Applicant's arguments filed 21 June 2002 have been fully considered but they are not persuasive. Applicant makes the following arguments:

1. Argument that Paoli does not show that the refractive index of the semiconductor layer varies in a layer direction.

2. Argument that there is no motivation to combine Paoli and Andrews.
3. Argument that there is no motivation to combine Paoli, Andrews, and Sanders.

Regarding argument 1, Fig. 3A of Paoli shows the semiconductor layer 10' having many different layers 20-36'. Examiner contends that each of these layers is made of a different material and thus has a different refractive index. Therefore, the refractive index varies in a step wise manner, changing at the interface between each layer.

Regarding argument 2, the system of Andrews is similar to the system of Paoli in that a laser section is integrated with an amplifier section. Therefore, there is motivation that parts of Andrews that improve performance would likely improve performance in Paoli, therefore it would have been obvious to use such parts in Paoli.

Regarding argument 3, Sanders is used to show motivation for putting the output of an amplifier into a waveguide. Presently, Paoli does not teach where the output of the amplifier should be sent. Since Sanders shows a reason for sending the output of the amplifier to a waveguide as shown in the rejection above, then there is motivation for combining Sanders with Paoli.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JM
July 10, 2002


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